AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1 - 7. (Canceled)

8. (Previously Presented) An optical function generator comprising:

an optical pulse generator for generating an optical pulse train;

an optical Fourier transform circuit for converting the shape of the frequency spectrum of the optical pulse input from the optical pulse generator to a time waveform, the optical Fourier transform circuit having an optical phase modulator driven at the repetition frequency of the input optical pulse train from the optical pulse generator and a dispersive medium; and

an optical filter for shaping the spectrum of the input optical pulse and determining the time wavefrom of the output optical pulse in accordance with frequency characteristics, the optical filter being inserted before the optical Fourier transform circuit,

wherein the optical Fourier transform circuit generates an optical pulse having a desired time waveform depending on the function form of the frequency characteristics of the optical filter, by reproducing, directly in the time domain, the spectrum shaped as desired by the optical filter.

9. (Original) An optical function generator according the Claim 8, wherein a Fourier-transform-limited pulse is used as the input optical pulse.

10. (Original) An optical function generator according to Claim 8, wherein the optical phase modulator is driven at a clock frequency reproduced from the input optical

pulse train, and linearly chirps the input optical pulse; and the dispersive medium gives group-velocity dispersion.

11. (Previously Presented) An optical function generator comprising:

an optical pulse generator for generating an optical pulse train;

an optical Fourier transform circuit for converting the shape of the frequency spectrum of the optical pulse input from the optical pulse generator to a time waveform, the optical Fourier transform circuit having an optical phase modulator driven at the repetition frequency of the input optical pulse train from the optical pulse generator and a dispersive medium; and

an optical filter for shaping the spectrum of the input optical pulse, the optical filter being inserted before the optical Fourier transform circuit,

wherein the optical Fourier transform circuit generates an optical pulse having a desired time waveform, by reproducing, directly in the time domain, the spectrum shaped as desired by the optical filter,

in the optical Fourier transform circuit,

the dispersive medium gives group-velocity dispersion to the optical pulse output from the optical filter;

the optical phase modulator is driven at a clock frequency reproduced from the input optical pulse train, and linearly chirps the optical pulse output from the dispersive medium; and

the dispersive medium receives the optical pulse output from the optical phase modulator, gives group-velocity dispersion again, and compensates for the remaining chirp.

12. (Previously Presented) An optical function generator comprising:

an optical pulse generator for generating an optical pulse train;

and optical Fourier transform circuit for converting the shape of the frequency spectrum of the optical pulse input from the optical pulse generator to a time waveform, the optical Fourier transform circuit having an optical phase modulator driven at the

repetition frequency of the input optical pulse train from the optical pulse generator and a dispersive medium; and

an optical filter for shaping the spectrum of the input optical pulse, the optical filter being inserted before the optical Fourier transform circuit,

wherein the optical Fourier transform circuit generates an optical pulse having a desired time waveform, by reproducing, directly in the time domain, the spectrum shaped as desired by the optical filter,

in the optical Fourier transform circuit,

the optical phase modulator is driven at a clock frequency reproduced from the input optical pulse train, and linearly chirps the optical pulse output from the optical filter;

the dispersive medium gives group-velocity dispersion to the optical pulse output from the optical phase modulator; and

the optical phase modulator receives the optical pulse output from the dispersive medium, gives another linear chirp, and compensates for the remaining chirp.

13. (Original) An optical function generator according to Claim 8, wherein the chirp rate K of phase modulation by the phase modulator and the group-velocity dispersion D of the dispersive medium satisfy a relationship of $K = 1/D$.

14. (Canceled)

15. (Currently Amended) An optical function generation method using an optical function generator comprising an optical pulse generator, an optical Fourier transform circuit, and an optical filter, the optical Fourier transform circuit having an optical phase modulator and a dispersive medium, the optical function generation method including [[that]]:

shaping the spectrum of an input optical pulse from the optical pulse generator, and determining the time waveform of the output optical pulse in accordance with frequency characteristics, by inserting the optical filter before the optical Fourier transform circuit;

driving the optical phase modulator at the repetition frequency of the input optical

pulse train; and

generating an optical pulse having a desired time waveform, depending on the function form of the frequency characteristics of the optical filter, by reproducing, directly in the time domain, the spectrum shaped as desired by the optical filter, by means of the optical Fourier transform circuit.